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Integrating Biosafety and Biosecurity

Sandia National Laboratories

Laboratory Biosecurity and Biosafety Workshop

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www.biosecurity.sandia.gov

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Sandia National Laboratories

Strengthening Biological Risk Management

Vision for Integrated BioRisk Management:

- ✓ Increased focus on "awareness" to change current culture
- ✓ Clarify terminology
- ✓ Development of targeted "training strategies"
- ✓ Securing "commitment" from key stakeholders, including government officials, who must be on board
- ✓ Continue increasing "capacity" based on Regional/Country needs and establish accountability through development of Country "report cards"

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Similar Physical Aspects of Biosafety and Biosecurity

Biosafety

- Physical protection
  - Increasing levels of physical containment to prevent the accidental release of dangerous biological agents
    - BSL-1
    - BSL-2
    - BSL-3
    - BSL-4
  - Examples: negative air pressure, cabinets and hoods

Biosecurity

- Physical protection
  - Graded protection designed to secure dangerous biological agents from adversaries
    - Property Protection Area
    - Limited Area
    - Exclusion Area
  - Examples: access controls, delay, intrusion detection

Similar Procedural Aspects of Biosafety and Biosecurity

Biosafety

- Material control and accountability
  - Handling procedures to prevent accidental infection
  - Use of personal protective equipment
- Personnel reliability
  - Background checks to ensure proper credentials to handle dangerous organisms
  - Policies to prevent untrained individuals from working with materials that pose a biosafety risk

Biosecurity

- Material control and accountability
  - Basic inventory procedures to limit opportunities for illicit acquisition
  - Designation of laboratory workers responsible for specific material
- Personnel reliability
  - Background checks to ensure personnel are reliable and trustworthy
  - Procedures to remove unauthorized personnel from secure areas

Similar Procedural Aspects of Biosafety and Biosecurity

Biosafety

- Transport
  - Requirements to ensure the safe transport of materials within a lab
  - Federal and international regulations governing the transport of infectious substances outside the lab

Biosecurity

- Transport
  - Best practices to ensure the secure transport of materials both inter-facility and intra-facility
  - Chain of custody where appropriate

Biosafety and Biosecurity share a variety of components

Laboratory Biosecurity Supports Laboratory Biosafety

- **Laboratory biosecurity supports the laboratory biosafety agenda of preventing disease in people, animals, and plants and minimizing the risk of worker injury**

- **Safe and secure laboratories help**
  - **Ensure the containment of hazardous infectious substances in laboratories**
  - **Maintain citizens' confidence in the activities of the bioscience research community**
  - **Increase transparency to investors in the biomedical and biotechnology industries**
  - **Protect valuable research and commercial assets**
  - **Reduce the risks of crime and bioterrorism**

WHO LBM Biosafety Levels 1 and 2

Biosafety Measure	Provides Security	Potential to Compromise Security
Signage		✓
Authorization of Entry	✓	
Windows and Doors		✓
Decontamination & Waste Handling	✓	
Emergency Power	✓	
Physical and Fire Security	✓	

WHO LBM Biosafety Level 3

Biosafety Measure	Provides Security	Potential to Compromise Security
Signage		✓
Self-closing, and Interlocking Access Doors	✓	
Sealed and Break Resistant Windows	✓	
Decontamination & Waste Handling	✓	

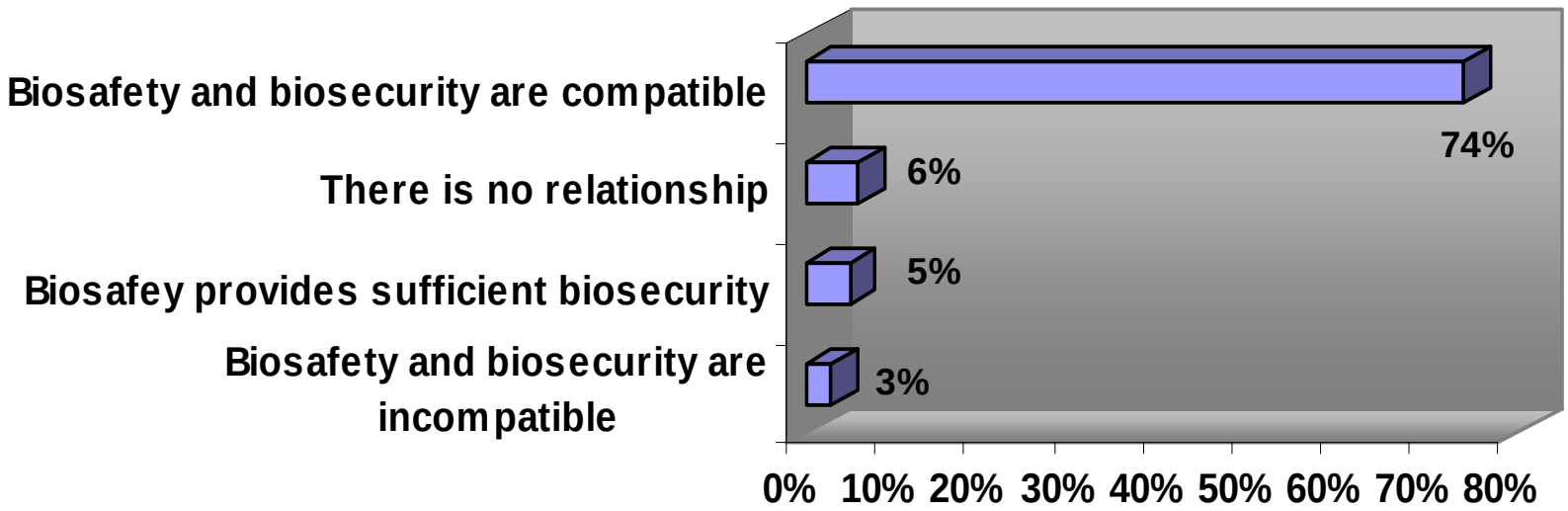
WHO LBM Biosafety Level 4

Biosafety Measure	Provides Security	Potential to Compromise Security
Two-person rule	✓	
Controlled Access	✓	
Primary Containment	✓	
Decontamination & Waste Handling	✓	
Emergency Power	✓	

Potential Conflicts between Biosafety and Biosecurity

- Emergency alarm – electronic locks
  - Safety – doors fail open
  - Security – doors fail secure
- Emergency egress
  - Safety – move people into the safest location as quickly as possible
  - Security – prevent people from moving into or through restricted areas
- Emergency response
  - Safety – provide emergency responders with locations of hazards and responsible individuals
  - Security – control distribution of sensitive information only to those with a need to know
- Signage
  - Safety – identify hazardous substances and responsible parties
  - Security – avoid identification of target materials or individuals with access
- Keys required inside laboratory areas
  - Safety – contamination concern
  - Security – multiple layers of access

Biosafety and Biosecurity are Compatible



"A program should be designed to incorporate both activities [biosafety and biosecurity] into a daily regime that allows for productive work as well as safety and security."

Summary

- Biosafety and biosecurity mitigate different risks, but they share a common goal
  - Keeping dangerous pathogens safely and securely inside the areas where they are stored and used
- Biosafety and biosecurity must work as coordinated, complementary systems
- A sound biosafety system can provide some biosecurity
- But biosafety alone cannot provide sufficient biosecurity
  - Biosecurity policies and procedures should be developed
  - Several potential conflicts between biosafety and biosecurity should be resolved
- Good laboratory biosecurity practices reinforce and strengthen laboratory biosafety systems

- "Security precautions should become a routine part of laboratory work, just as have aseptic techniques and other safe microbiological practices." (WHO LBM 3rd edition)

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Additional Information

- **Next edition of CDC/NIH *Biosafety in Microbiological and Biomedical Laboratories* will include extensive recommendations on biosecurity**
- **WHO/FAO/OIE developing joint international biosecurity guidelines – Biorisk Management: Laboratory Biosecurity**
- **Organisation for Economic Co-operation and Development (OECD) is establishing biosecurity guidelines**
- **Laboratory Biosecurity Handbook – CRC Press, forthcoming**
- **www.biosecurity.sandia.gov**